

WHAT IS CLAIMED IS:

1 1. A package for providing high density storage, comprising:
2 a carrier housing for holding multiple storage devices; and
3 a package-level RAID controller, coupled to the carrier housing, the package-
4 level RAID controller providing a RAID logical configuration at a package-level for the
5 storage devices held in the carrier housing.

1 2. A package for providing high density storage, comprising:
2 a carrier housing for holding multiple storage devices proximate to one another
3 and aligned in a row; and
4 a controller, coupled to the carrier housing, the controller configured to virtualize
5 logical addresses of the multiple storage devices as at least one aggregate volume to
6 provide a layer of abstraction to the storage devices.

1 3. The package of claim 2, wherein the controller hides the physical address
2 of the storage devices.

1 4. The package of claim 2, wherein the controller is further configured to
2 provide a hot spare held in the carrier housing for use when a storage device fails.

1 5. The package of claim 2, wherein the carrier housing is configured to be
2 conformal to multiple storage devices to minimize the amount of space used to house a
3 predetermined number of storage devices.

1 6. The package of claim 2, wherein the carrier housing further comprises
2 fault indicators for allowing notification of an inoperable storage devices.

1 7. The package of claim 6, wherein the fault indicators are battery-powered.

1 8. The package of claim 2, wherein the carrier housing further comprises a
2 spring-loaded bracket for holding each storage devices in place.

1 9. A package-level RAID controller, comprising:
2 memory for storing data therein; and
3 a processor, coupled to the memory, the processing being configured for
4 providing a RAID logical configuration at a package-level for storage devices held in a
5 carrier package.

1 10. A package controller, comprising:
2 memory for storing data therein; and
3 a processor, coupled to the memory, the processing being configured for
4 virtualizing logical addresses of the multiple storage devices as at least one aggregate
5 volume to provide a layer of abstraction to the storage devices.

1 11. The package controller of claim 10, wherein the processor is configured to
2 hide the physical address of the storage devices.

1 12. The package controller of claim 10, wherein the processor is configured to
2 provide a hot spare held in the carrier housing for use when a storage device fails.

1 13. The package controller of claim 10, wherein the processor is configured to
2 present the storage devices in the carrier housing as one logical storage device.

1 14. A storage system, comprising:
2 a plurality of packages for providing high density storage, each package
3 comprising a carrier housing for holding multiple storage devices and a package-level
4 RAID controller, coupled to the carrier housing, for providing a RAID logical
5 configuration at a package-level for storage devices held in a package;
6 an enclosure for holding the plurality of the packages for providing high-density
7 storage;
8 a package aggregator, coupled to the plurality of packages, the package
9 aggregator providing connections to each of the plurality of packages for power, control
10 and signaling; and
11 a system level controller, coupled to the plurality of packages, for implementing a
12 desired storage system configuration.

1 15. The storage system of claim 14, wherein the system level controller
2 comprises a system-level RAID controller for providing a system-level RAID logical
3 configuration across the plurality of packages.

1 16. The storage system of claim 14, wherein the system level controller
2 comprises a system-level RAID controller for providing a system-level RAID logical
3 configuration across the plurality of packages and each of the package-level RAID
4 controllers providing a package-level RAID logic configuration across the plurality of
5 storage devices in a package.

1 17. The storage system of claim 14, wherein a first of the plurality of packages
2 presents a first package-level RAID logical configuration across the plurality of storage
3 devices in the first of the plurality of packages and a second of the plurality of packages
4 presents a second package-level RAID logical configuration across the plurality of
5 storage devices in the second of the plurality of packages.

1 18. The storage system of claim 17, wherein the system level controller
2 comprises a system-level RAID controller for providing a system-level RAID logical
3 configuration across the first and second of the plurality of packages.

1 19. A storage system, comprising:
2 a plurality of packages for providing high density storage, each package
3 comprising a carrier housing for holding multiple storage devices proximate to one
4 another and aligned in a row and a package controller, coupled to the carrier housing, for
5 virtualizing logical addresses of the multiple storage devices as at least one aggregate
6 volume to provide a layer of abstraction to the storage devices;
7 an enclosure for holding the plurality of the packages for providing high-density
8 storage;
9 a package aggregator, coupled to the plurality of packages for providing high
10 density storage, the package aggregator providing connections to each of the plurality of
11 packages for power, control and signaling; and
12 a system level controller, coupled to the plurality of packages, for implementing a
13 desired storage system configuration.

1 20. The storage system of claim 19 further comprising an access device,
2 coupled to the carrier housing, for structuring access to physical addresses of the multiple
3 storage devices and providing access to each of the multiple storage devices over one
4 connection.

1 21. The storage system of claim 19, wherein the access device aggregates the
2 physical addresses of the storage devices into logical addresses and makes the logical
3 addresses available over one connection.

- 1 22. A package for providing high density storage, comprising:
2 means for holding multiple storage devices; and
3 means, coupled to the means for holding, for providing a RAID logical
4 configuration at a package-level for the storage devices held in the means for holding.

1 23. A package for providing high density storage, comprising:
2 means for holding multiple storage devices proximate to one another and aligned
3 in a row; and
4 means, coupled to the means for holding, for virtualizing logical addresses of the
5 multiple storage devices as at least one aggregate volume to provide a layer of abstraction
6 to the storage devices.

1 24. A method for providing a high density storage package, comprising:
2 providing a carrier housing for holding multiple storage devices; and
3 providing a RAID logical configuration at a package-level for the storage devices
4 held in the carrier housing.

1 25. A method for providing a high density storage package, comprising:
2 providing a carrier housing for holding multiple storage devices proximate to one
3 another and aligned in a row; and
4 virtualizing logical addresses of the multiple storage devices as at least one
5 aggregate volume to provide a layer of abstraction to the storage devices.